

8165

Diag. Cht. No. 1107 and 1208-2.

Form 504

U. S. COAST AND GEODETIC SURVEY

DEPARTMENT OF COMMERCE

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. ECEP-1254 Office No. H-8165

LOCALITY

State Massachusetts

General locality Cape Cod Bay

Locality Plymouth Bay and Harbor

1945 54-55

CHIEF OF PARTY

C. R. Reed and M. T. Paulson

LIBRARY & ARCHIVES

DATE December 21, 1956

DEPARTMENT OF COMMERCE

U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

REGISTER No. H-8165

Field No. ECEP-1254

State MASSACHUSETTS

General locality CAPE COD BAY

Locality AND
PLYMOUTH BAY & HARBOR

Scale 1:10,000 Date of survey 11 June to 27 Oct. 1954 &
13 to 20 July 1955

Instructions dated 29 Jan. 1954

Vessel EAST COAST FIELD PARTY

Chief of party CLARENCE R. REED & M.T. PAULSON

Surveyed by EDWIN K. McCAFFREY

Soundings taken by ~~YACHTSMAN~~ graphic recorder, hand lead, ~~with~~

Fathograms scaled by PARTY PERSONNEL

Fathograms checked by NORFOLK DISTRICT OFFICE

Protracted by A.G. ATWILL

Soundings penciled by A.G. ATWILL

Soundings in ~~fathoms~~ feet at MLW ~~MLW~~ and are true depths

REMARKS: This survey was smooth plotted in the Hydrographic
Section of the Norfolk District Office.

See attached report covering additional work done
during the 1955 field season.

NOTES FOR DESCRIPTIVE REPORT
TO ACCOMPANY

Hydrographic Sheet H-8165 (FIELD NO. ECFP 1254)
Plymouth Bay and Harbor, Massachusetts

EAST COAST FIELD PARTY

CLARENCE R. REED, CHIEF OF PARTY

PROJECT CS-368

1954

SCALE 1:10,000

* * * * *

PROJECT This survey was accomplished under instructions dated 29 January 1954, calling for a new hydrographic survey of Plymouth Bay and vicinity.

SURVEY LIMITS AND DATES The survey on this sheet covers that portion of Chart 245 lying south of latitude $42^{\circ} 00'$.

Kingston Bay and the Jones River also appear on this sheet.

Junctions were made with prior survey H-6563⁽¹⁹⁴⁹⁾, and with contemporary surveys H-8164 (FIELD NO. ECFP 1154) to the north, and H-8166 (FIELD NO. ECFP 1354) to the east. ⁽¹⁹⁵⁴⁻⁵⁵⁾ ⁽¹⁹⁵⁴⁻⁵⁵⁾

Work on this project began 11 June and was concluded 27 October 1954.

VESSEL AND EQUIPMENT Launches number CS-172 and CS-82 were used consecutively in this survey. Both operated from a mooring east of State Pier at Plymouth, Massachusetts.

Echo soundings were obtained with Graphic Recorders number 71S and 77. Both operated with transducers mounted inboard in the launches. Recorder number 71S was used in Launch CS-172 for the period 11 June through 30 August, 1954. Recorder number 77 was used in Launch CS-82 for the period 16 September through 28 October 1954.

TIDES AND CURRENTS The tide note is appended to this report. No current observations were made on this project.

SMOOTH SHEET The smooth sheet is to be plotted by the Norfolk Processing Office.

CONTROL STATIONS The control consisted mainly of triangulation and photo-hydro stations. The latter were plotted on Air-photo Compilation Sheets T-11173, T-11174, T-11177 and T-11178 by photogrammetrist J. C. Lajoie. These were transferred to the boat sheet by officers of this party.

All necessary hydrographic stations were located by three or more sextant cuts to the station.

SHORELINE AND TOPOGRAPHY The shoreline and topographic details were transferred from Air-photo Compilation Sheets T-11173, T-11174, T-11177 and T-11178⁽¹⁹⁵⁴⁾. There were no additions or revisions to shoreline made during the progress of hydrography. Elevations of rocks awash in the Rocky Point area were revised.

SOUNDINGS Soundings were taken by Graphic Recorder, sounding pole and hand lead. Bottom samples were obtained using an armed hand lead.

CONTROL OF HYDROGRAPHY The sounding lines on this sheet were controlled by means of three point sextant fixes. No unusual jumps were observed in changing control stations. Fixes on sounding lines were taken at 1 minute and $1\frac{1}{2}$ minute intervals. Offshore hydrography was controlled by the use of circular arcs, constructed on the "Circle Sheet" principle using the locus of points of three prominent on-shore control stations.

Check angles were taken to verify the location of all detached positions.

ADEQUACY OF SURVEY This survey is considered complete and adequate to supersede prior surveys. All necessary depth curves are complete and indicated on boat sheet. Junctions were made satisfactorily with prior and contemporary surveys and a comparison was made with channel surveys in Plymouth Harbor made in October 1953 by the U.S. Army Engineers. (See Chief of Party note at end of report.)

CROSSLINES Crosslines were run as instructed with satisfactory agreement at all crossings. *Review, #5 2 & 7*

COMPARISON WITH PRIOR SURVEYS *Review, #5* A comparison with prior survey H-6563 showed good agreement at its junction with the eastern edge of this survey. (See Chief of Party note at end of report) There are no prior surveys of recent date covering Plymouth Harbor and vicinity. A comparison with H-3906a of 1917 showed good agreement. Areas in and adjacent to channel areas showed some changes which will be discussed in the comparison with U.S. Engineers survey and with chart. (*Bps. 5/288-89*)

The U.S.E. after dredging survey of August - October 1953 shows a controlling depth of 15 feet for channel width of 200 feet and turning basins. Channel lines run for comparison purposes show the following discrepancies.

A depth of 14.4 feet in the middle of the turning basin east of State Pier. (Latitude $41^{\circ} 57.58'$, longitude $70^{\circ} 39.58'$) This sounding is on a continuous sounding line between position 135 - 136 b day Launch 82.

Depth of ~~12.0~~ ^{13.8 (14)} feet midchannel in latitude $41^{\circ} 57.69'$, longitude $70^{\circ} 39.30'$. These soundings appear on a continuous sounding line between 58 - 59 e day, volume 2, page 38.

A depth of 13.6 feet in midchannel in latitude $41^{\circ} 57.65'$, longitude $70^{\circ} 39.38'$. This sounding is on a continuous sounding line between positions 22 - 23 g day volume 3 page 9.

Shoaling to 12 feet is indicated along edges of the channel, particularly on the southwest side in the vicinity of Red Nun Buoy No. 8 (latitude $41^{\circ} 58.45'$, longitude $70^{\circ} 39.14'$). The Engineers survey shows similar indications in this area.

In view of the fore-going paragraphs it is recommended that the controlling depth be listed as 12 feet.

That portion of the channel north of Plymouth Harbor Channel Light "4" has shoaled considerably at the edges. The present effective width and depth in that vicinity are 150 and 13.0 feet respectively. A least depth of 13.6 feet, midchannel, was discovered in this vicinity (latitude $41^{\circ} 58.96'$, longitude $70^{\circ} 39.39'$) as part of a continuous

sounding line between positions 2 - 3 of day volume 2 page 44. The position of this channel is some 70 meters west of that shown by the U.S.E. after dredging survey. The position of their channel lies over flats of 2 - 3 feet in depth. In addition, their survey shows Black Can Buoy No. 3 as apparently lying on the wrong side of the channel. This survey verified their position of that buoy, but showed the channel passing on the west side of it rather than the east side as they indicate.

COMPARISON WITH CHART

<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>CHART 245</u>	<u>1954 SURVEY</u>	<u>REMARKS</u>
41° 57.0'	70° 34.8'	* Sunken Rock	---	An extensive search was made for this feature. Details of this search appear on P.19 of Vol.5. The least depth obtained was 9.2 in rocky bottom.*It is recommended that this feature be deleted.✓
		<i>* Deleted from chart</i>		
41° 57.0'	70° 34.9'	Rock Awash	Rock Awash	This rock bares 0.6 feet at MLW and lies 45 m. east of its charted position. Its location is listed as position 3 m P.19, Vol.5. In addition two other rock awash lie 160 m. & 210 M. respectively NW of this position. The location of these are given as positions 1 & 2 m on P. 18 - 19 of the same volume. These rocks bare 5 feet and 2 feet respectively at MLW. It is recommended that the chart be changed to agree. ✓
41° 57.1'	70° 35.1'	Rocks Awash	Rock Awash	Air-photo Compilation Sheet T-11178 shows one rock awash bare 2 feet at MLW instead of two as charted. The number and location was verified from adjacent sounding lines. It is recommended that the chart be corrected to show a single rock awash.*
		<i>* Tw Rks. retained from H-3906(1916)</i>		
41° 56.9'	70° 35.9'	Sunken Rocks	Rocks Awash	There are several rocks awash in this area. References and locations of these are given on P.89 of Vol.5. It is recommended the sunken rock symbol be deleted and the positions of these rocks awash be charted. <i>chart corrected</i>
41° 57. ²⁷ ₃ '	70° 35.0'	Rock Awash	2'	Outer Tautog Rock - A least depth of 2.7 feet was obtained as part of a continuous sounding line during investigation of this feature. (Position 34 35 1 day P.4 Vol. 16) Depths of 5 feet and 3 feet were obtained 128 & 50 mSW respectively of this position. During the course of the survey this rock was not observed to be awash, and local reports state that this rock "breaks" only at lowest tides. It is recommended that the rock awash symbol be deleted and the 2 foot sounding be charted and note "Outer Tautog Rock" be placed in slant lettering. ✓

LATITUDE	LONGITUDE	CHART 245	1954 SURVEY	REMARKS
41° 57.4'	70° 34.9'	16	18	This isolated 16 foot shoal does not appear as charted. An isolated A 16 foot spot does exist 180 m NW of this position. Development of this area also indicates the 18 foot curve in this area extends further north than is charted. It is recommended the chart be so changed to conform with this. <u>cht. revised</u>
			<i>Retained 16 ft. from W.D.</i>	
41° 58.0'	70° 34.8'	36	482	<u>42 new charted</u>
41° 58.6'	70° 35.1'	48	401	<u>*** chart 41</u>
41° 58.9'	70° 36.0'	Bottom	48 S	All bottom samples on and immediately south of Browns Bank indicate <u>hard packed - fine grey sand.</u>
		Characteristic	<i>fine gy</i>	
		<i>Deleted from chart</i> → Grass		
42° 00.0'	70° 35.0'	73	67	<u>67 new charted</u>
41° 59.3'	70° 35.3'	25	28 25	<u>agreement</u>
41° 59.3'	70° 35.6'	32	26 22	<u>22 new charted</u>
41° 59.2'	70° 35.7'	28	28 23	<u>22 now charted close by</u>
41° 56.7'	70° 37.3'	* Rocks	-----	These rocks appear to be erroneously charted. Air-photo Compilation Sheet T-11178 shows four rocks awash in latitude 41° 56.38' longitude 70° 36.78'. These positions were verified from adjacent sounding lines. Local report state that there are only these 4 rocks awash in the area. It is recommended that the rocks awash be recharted using the Air-photo locations.*
		* Prior rks. retained inasmuch as they are shown on both T-3625 & H-3906 (1916). Not considered disproved by present survey or contemporary air-photo compilation		
41° 59.7	70° 37.75	* Rock Awash	-----	This rock was searched for as outlined on P.4 of Vol.8. It could not be found at low tide and it is recommended that this feature be removed from the chart. <u>* RK. removed from chart</u>

Examination of the 18 foot curve indicates that Browns Bank now extends further eastward than is charted. ✓

Channels in Plymouth Harbor, with the exception of the main improved channel, appear to have controlling depths slightly less than is charted. Their configuration has varied little from charted channels, however, in some cases continuity shown on the chart no longer exists due to shoaling. ✓

The Nummet Channel now has a controlling depth of 14³ feet at entrance. The charted depth shows 11 feet. From its division point, the north branch has a controlling depth of 11 feet, to a point due south of Standish Shore. ✓ The south branch to the Cordage Works has a controlling depth of 14² feet.

The channel into Kingston Bay has a controlling depth of 2¹ feet to the mouth of the Jones River. ✓

The channel south of Ichabods Flat has a controlling depth of 8⁸ feet at its entrance ~~rather than 6 feet~~ as is charted. ✓

Goose Point Channel has a controlling depth of 2 feet rather than 8 feet as is shown. ✓

PRELIMINARY REVIEW BY CHART DIVISION - CHART 245

Item 1 This spot was investigated by a system of closely spaced sounding lines and a least depth of 10.2' was found on a continuous sounding line between positions 86 - 85 j day - P.28 volume 15. This was the shallowest depth recorded in rocky bottom and occurs ~~80 m~~ ^{30 m} NW of the present charted 10' position to verify this depth. (It is recommended that the 10 foot

sounding be moved to its new location. (Prior is in agreement w/present depths)

Item 2 This 16 foot shoal was investigated by fathometer and lead line. A least depth of 18.6 feet was discovered by fathometer between positions 120 - 121 j day P. 37, volume 15. This occurred 90 m south of the charted sounding. The only rock indicated by this search was found 260 m NE of the charted sounding. The least depth on this was a lead line sounding of 18.6 feet. The position of this rock is 106 j, P. 33, volume 15. It is probable that the least depth in the vicinity is about 18 feet. The 16 foot sounding in this rocky area cannot be disproved without wire drag, and it is not practical to drag so close to the bottom. It is recommended that the 16 foot sounding be retained on the charts. (Two 16-ft. sdgs. retained)

Item 3 The 4 foot charted depth on Gurnet Rock and the 5 foot depth charted 200 m SW were not discovered by fathometer investigation. A least depth of 8.6 feet fathometer was found 50 m north of the 5 foot charted sounding. This is position 25 k, page 48 volume 15. The least depth in the vicinity of Gurnet Rock was a fathometer sounding of 12.8 feet 40 m SW of the charted position of the rock. High tide and heavy seas prevented an adequate investigation. Further investigation made in 1955

Local reports state that kelp patches are visible on the surface at low tide. Accordingly, it is recommended that the present charted soundings be retained until such time as they may be verified or disproved by more detailed survey. See 1955 D. Report & Review, P5

Item Not Numbered Shoaling reported in Plymouth Harbor Improved Channel was previously discussed in the Comparison With the Army Engineers after Dredging Survey.

Item 7 U.S. Engineers after dredging survey has been discussed under "Comparison with Prior Surveys."

The Marine Railway indicated on the review is the main one in Plymouth. It is located east of Plymouth Harbor South Channel Range Beacons and is indicated on Boat Sheet and Air-photo Compilation Sheet T-11177. The railway can accommodate boats to 100 feet in length, 8 feet in draft and up to 150 tons.

COAST PILOT A separate report on Coast Pilot will be made.

AIDS TO NAVIGATION No fixed aids to navigation were located. Floating aids to navigation were located as follows:

See Processing Office list of floating aids

NAME (1953 LIGHT LIST)	LOCATION	DEPTH	VOL.	PAGE	DATE
Gurnet Point Bell Buoy	41° 59.94' N 70° 35.10' W	66	8	48	25 Aug. 1954
Gurnet Rock Buoy 2	42° 00.22' N 70° 35.61' W	27	15	42	26 Oct. 1954
Plymouth Entrance Buoy 1	41° 59.54' N 70° 35.51' W	23	12	56	8 Oct. 1954
Plymouth Channel Buoy 4	41° 59.83' N 70° 35.88' W	22	12	10	8 Oct. 1954

NAME (1953 LIGHT LIST)	LOCATION	DEPTH	VOL.	PAGE	DATE
Plymouth Channel Lighted Buoy 3	41° 59.68' 70° 36.45' 52	28 ⁷	8	15	23 Aug. 1954
Plymouth Channel Buoy 5	41° 59.18' 70° 37.42' 72	34	6	7	10 Aug. 1954
Plymouth Channel Buoy 6	41° 59.33' 70° 37.93	23	6	7	10 Aug. 1954
Duxbury Bay Channel Buoy 1	41° 59.36' 70° 39.21'	21 22	14	71	14 Oct. 1954
Duxbury Bay Channel Buoy 2	41° 59.50' 70° 39.01' 5	24 ³	3	32	25 June 1954
Nummet Channel Entrance Buoy	41° 59.20' 70° 39.45'	22	1	5	11 June 1954
Nummet Channel Buoy 2	41° 59.13' 70° 39.53'	19	7	61	23 Aug. 1954
Nummet Channel Buoy 4	41° 59.21' 70° 39.98'	18 ⁸	4	24	29 June 1954
Nummet Junction Buoy	41° 59.34' 70° 40.21'	18 ⁷	4	24	29 June 1954
Cordage Channel Buoy 1	41° 59.34' 70° 40.51'	13	4	18	29 June 1954
Cordage Channel Buoy 3	41° 59.40' 70° 40.60'	15 ⁶	4	18	29 June 1954
Cordage Channel Buoy 5	41° 59.38' 70° 40.87' 75	9	4	17	29 June 1954
Cordage Channel Buoy 9	41° 59.32' 70° 40.85' 13	10 9	4	17	29 June 1954
Cordage Channel Buoy 13	41° 59.17' 70° 40.98'	8 ⁸	4	17	29 June 1954
Plymouth Harbor Channel Buoy 2	41° 59.09' 70° 39.24'	20 21	1	4	11 June 1954
Plymouth Harbor Channel Lighted Bell Buoy 1	41° 59.11' 70° 39.37'	21 20	1	5	11 June 1954
Plymouth Harbor Channel Buoy 3	41° 58.88' 70° 39.37'	14 ³	1	5	11 June 1954

NAME '1953 LIGHT LIST)	LOCATION	DEPTH	VOL.	PAGE	DATE
Plymouth Harbor Channel Buoy 5	41° 58.76' 70° 39.35' ¹⁷	18 ⁵	1	5	11 June 1954
Plymouth Harbor Channel Buoy 7	41° 58.69' 70° 39.30'	13	1	5	11 June 1954
Plymouth Harbor Channel Buoy 8	41° 58.44' 70° 39.12'	16	1	5	11 June 1954
Plymouth Harbor Channel Buoy 10	41° 58.08' ¹⁰ 70° 38.81'	23 ³	1	5	11 June 1954
Plymouth Harbor Channel Buoy 12	41° 57.92' ⁵ 70° 38.94'	16	1	6	11 June 1954
Plymouth Harbor Channel Buoy 13	41° 57.93' ⁵ 70° 38.86'	14	1	6	11 June 1954
Plymouth Harbor Channel Buoy 14	41° 57.75' ⁷ 70° 39.18'	19	1	6	11 June 1954
Plymouth Harbor Channel Buoy 15	41° 57.72' 70° 39.18'	18	1	6	11 June 1954
Plymouth Harbor Channel Buoy 16	41° 57.62' 70° 39.52'	27	1	6	11 June 1954
Plymouth Harbor Channel Buoy 17	41° 57.55' 70° 39.56' ⁵	17	1	6	11 June 1954
Plymouth Harbor Channel Buoy 18	41° 57.61' 70° 39.63'	11	1	6	11 June 1954
Plymouth Harbor Channel Buoy 19	41° 57.57' 70° 39.71'	11	1	7	11 June 1954
Plymouth Harbor Channel Buoy 21	41° 57.63' 70° 39.81'	16	1	7	11 June 1954
Plymouth Harbor Channel Buoy 22	41° 57.73' ⁰ 70° 39.90'	28	1	7	11 June 1954
✓ Plymouth Harbor Channel Buoy 23	41° 57.67' 70° 39.92'	11	1	7	11 June 1954

LANDMARKS Landmarks will be submitted separately on form 567. It is recommended that the description of the Standpipe in latitude 41° 56.9', longitude 70° 35.3' be changed to read "Oil Tank". C.L. 1067(1953)

GEOGRAPHIC NAMES There are no changes or additions to geographic names to report.

See next page for added notes by
Chief of Party.

Respectfully submitted,

Edwin K. McCaffrey
Edwin K. McCaffrey
ENS., USC&GS

HYDROGRAPHIC SURVEY H-8165

ADDED NOTES BY CHIEF OF PARTY

This survey fails to overlap prior survey H-6563 (scale 1/40,000) but soundings at the junction appear to be consistent. *overlap O.K.*

The large discrepancy in the position of the dredged channel near Plymouth Harbor Channel Light #4 as shown by the U.S. Engineers after dredging survey of September 1953 should be carefully examined. *Discrepancies resolved thru replotting*

While this survey is nearly complete, the end of the field season left a few spots under-developed. Desirable additional development has been indicated on the boat sheet in blue, particularly in the entrance opposite Gurnet Point. Gurnet Rock and the 5 foot sounding southwest (Item 3 of Preliminary Review) should be further investigated in calm weather. A leadline least depth on Outer Tautog Rock in calm weather should be obtained. *See 1955 Desc. Report attached*

Clarence R. Reed

Clarence R. Reed
CDR, USC&GS
OinC, East Coast Field Party

TIDE NOTE TO ACCOMPANY

Hydrographic Survey Sheet H-8165(Field No. ECFP 1254)

Tide data for the reduction of soundings was obtained from a portable automatic tide gage at State Pier, Plymouth Harbor Massachusetts. This gage was maintained by party personnel. The mean low water plane of reference on the tide staff, was furnished by the Washington Office.

STATION	LATITUDE	LONGITUDE	MLW ON STAFF
State Pier, Plymouth, Mass.	41° 57.57'	70° 39.77'	0.1

FATHOMETER CORRECTIONS

Hydrographic Survey Sheet H-8165(Field No. ECFP 1254)

The corrections tabulated below are based on an initial set at zero feet on the fathogram. Index corrections have been entered in the sounding volumes where the initial varied from zero feet. All soundings were taken in feet.

FATHOMETER NO. 71S
11 June - 27 August 1954

Launch 172, red day letters

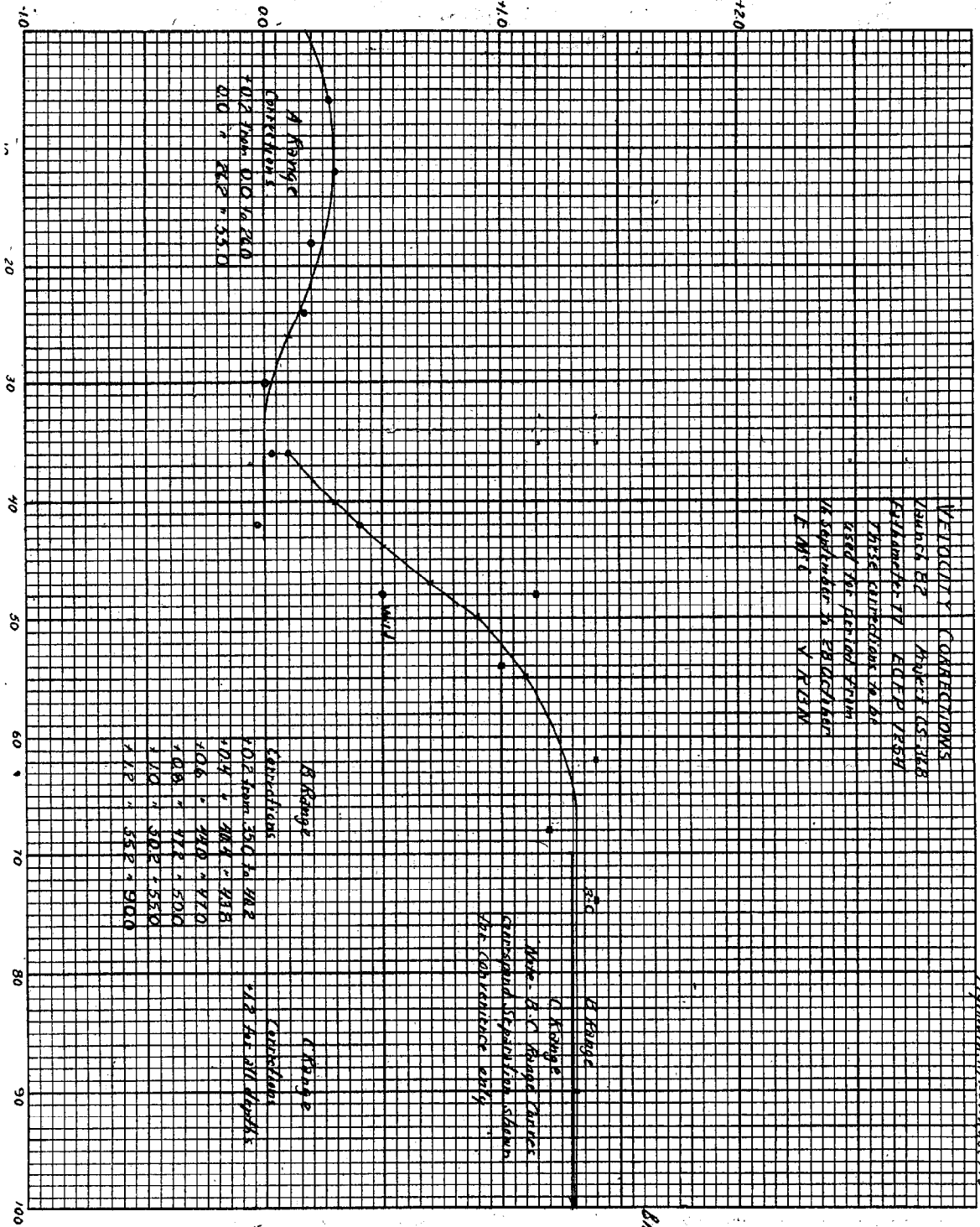
CORRECTION	DEPTH	
	from	To
A RANGE		
+0.6	0.0	10.0
+0.4	10.1	22.0
+0.2	22.1	55.0
B RANGE		
+2.2	35.0	39.1
+2.0	39.2	47.0
+1.8	47.1	55.0
+1.6	55.1	63.0
+1.4	63.1	70.9
+1.2	71.0	78.8
+1.0	78.9	86.8
+0.8	86.9	90.0
C RANGE		
+0.6	70.0	75.0
+0.4	75.1	82.7
+0.2	82.8	90.6
0.0	90.7	98.6
+0.2	98.7	100.0
-0.2		

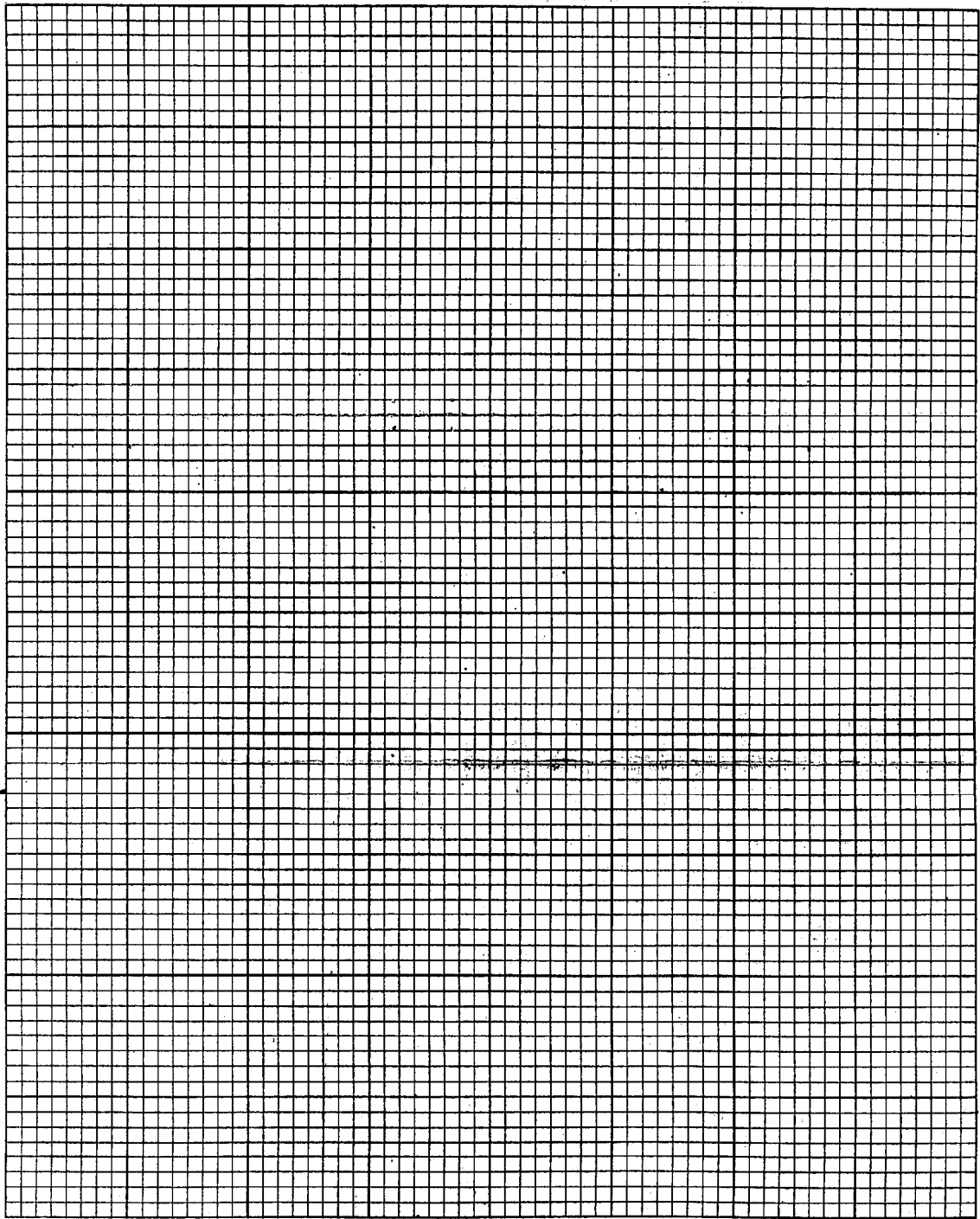
FATHOMETER NO. 77
16 September - 27 October 1954

Launch 82, blue day letters

CORRECTIONS	DEPTH	
	From	To
A RANGE		
+0.2	0.0	26.0
0.0	26.1	55.0
B RANGE		
+0.2	35.0	40.2
+0.4	40.4	43.8
+0.6	44.0	47.0
+0.8	47.2	50.0
+1.0	50.2	55.0
+1.2	55.2	90.0
C RANGE		
+1.2	All depths	

Corrections
in Feet





VELOCITY CORRECTIONS
Station 172 Project 48368
FALCONHEATER NIS FALP 4234

used for period from
11 June to 30 August

WPC • WPC

B. Hönig

742	700h	35.0	76.39
743	700h	39.2	47.0
744	700h	43.7	35.0
745	700h	45.4	63.0
746	700h	63.4	70.9
747	700h	70.0	76.8
748	700h	78.9	66.8
749	700h	84.9	90.0

The graph displays three curves, A, B, and C, plotted against a logarithmic scale on the y-axis (0.0 to 100) and a linear scale on the x-axis (0 to 100). Each curve has associated data points and correction values.

Curve A: A Range

Y-axis Value	X-axis Value
100.0	0.0
100.0	10.0
100.0	20.0
100.0	30.0
100.0	40.0
100.0	50.0
100.0	60.0
100.0	70.0
100.0	80.0
100.0	90.0
100.0	100.0

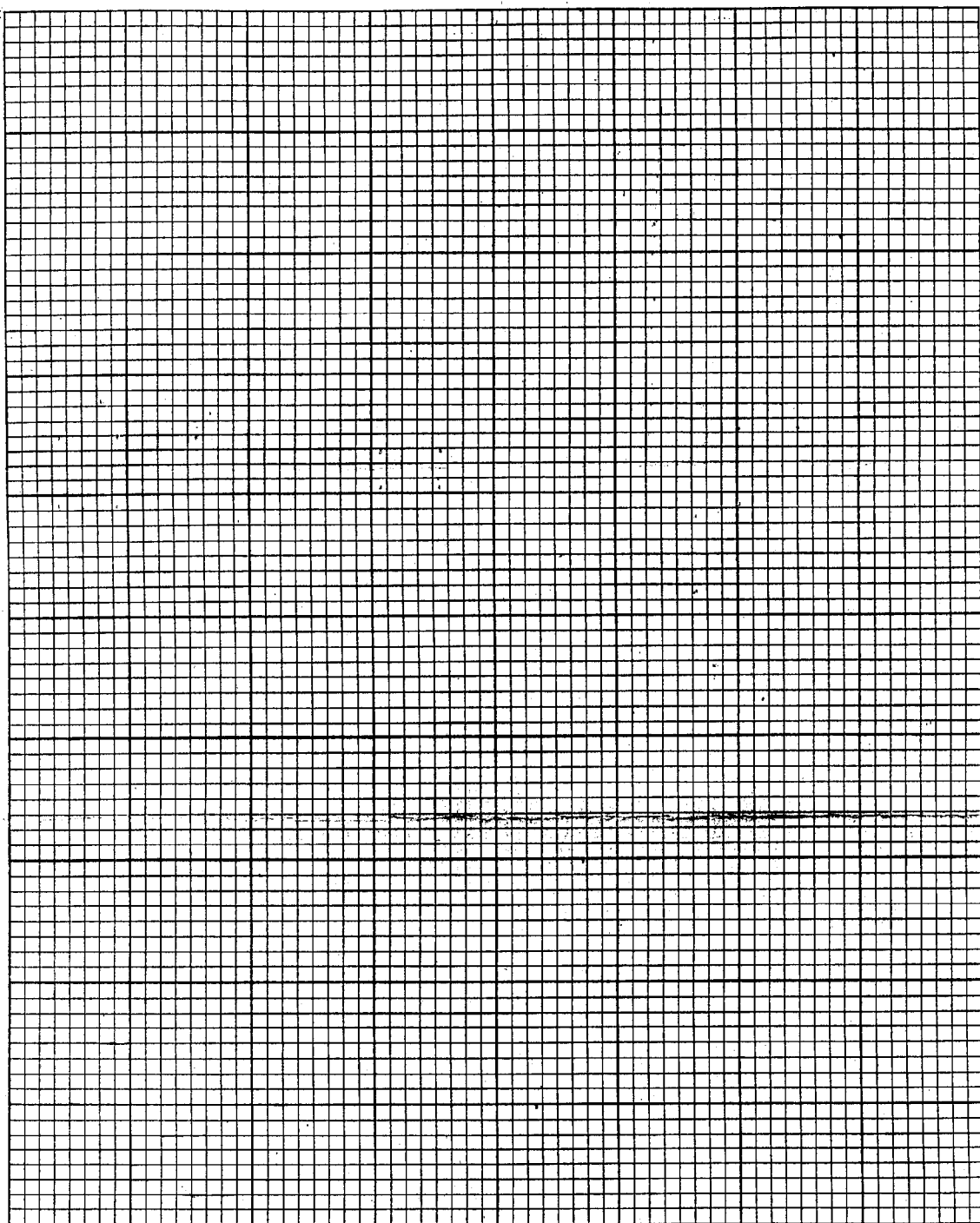
Curve B: B Range

Y-axis Value	X-axis Value
100.0	0.0
100.0	10.0
100.0	20.0
100.0	30.0
100.0	40.0
100.0	50.0
100.0	60.0
100.0	70.0
100.0	80.0
100.0	90.0
100.0	100.0

Curve C: C Range

Y-axis Value	X-axis Value
100.0	0.0
100.0	10.0
100.0	20.0
100.0	30.0
100.0	40.0
100.0	50.0
100.0	60.0
100.0	70.0
100.0	80.0
100.0	90.0
100.0	100.0

Red Jay letters



LIST OF SIGNALS
To Accompany
H-8165

TRIANGULATION STATIONS

CHAN	PLYMOUTH HARBOR, CHANNEL LIGHT NO. 11, 1953
CORD	PLYMOUTH CORDAGE WORKS, LARGE CHIMNEY (USC&GS), 1908-38
DISH	STANDISH MONUMENT, 1889-1938
FOUR	PLYMOUTH HARBOR, CHANNEL LIGHT NO. 4, 1953
GURN	PLYMOUTH (GURNET) L.H., 1938
HEAD	PLYMOUTH BEACH PIERHEAD DAY BEACON, 1953
HIGH	PLYMOUTH HIGH SCHOOL, DOME, 1908-35
MENT	PLYMOUTH NATIONAL MONUMENT, 1886-1935
PIER	DUXBURY PIER L.H., (USC&GS), 1887-1934
PIPE	DUXBURY STANDPIPE, 1938-43
PLYM	PLYMOUTH, ROCKY POINT HOUSE CHIMNEY, 1908-33

TOPOGRAPHIC STATIONS

SOURCE T-11173

Abe	Bop	Can	Dog	Don	Eva	Fat	Gab	Hoe	Ike
Kin	Let	Man	Nob	Oak	Pon	Rim	Rye	Sam	

TOPOGRAPHIC STATIONS

SOURCE T-11174

Les	Now	Oar	Try
-----	-----	-----	-----

TOPOGRAPHIC STATIONS

SOURCE T-11177

Are	Art	Ban	Cob	Dil	Egg	Erg	Fan	Fog	Gin
Gob	Hot	Ink	Jab	Nye	One	Pig	Ray	Red	Ree
Run	Sot	Tank	Tin	Von	War	Yow			

TOPOGRAPHIC STATIONS

SOURCE T-11178

Ant	Box	Cab	Ebb	Tan	Wet	You	Yum	Zip
-----	-----	-----	-----	-----	-----	-----	-----	-----

HYDROGRAPHIC STATIONS

Duk	Vol. 5, pg. 5
Ent	Vol. 1, pg. 35
Log	Vol. 15, pg. 42
Sig	Vol. 4, pg. 19 (ECFP-1154)
Hat	Same as "Hot" on ECFP-1154, transferred

STATISTICS TO ACCOMPANY HYDROGRAPHIC SHEET H-8165

(FIELD NO. MCFF-1254)

DATE 1954	DAY LTR	VOL. NO.	LEAD LINES	NO. OF POSITIONS	STAT. MI. SDG. LINES
LAUNCH #172					
11 June	a	1	19	19	3.8
14 "	b	1	0	126	14.8
16 "	c	1	47	47	0.6
17 "	d	1&2	0	142	18.1
18 "	e	2	0	70	10.4
22 "	f	2	0	70	9.4
25 "	g	3	2	166	22.8
29 "	h	3&4	7	155	21.9
2 July	j	4	1	122	16.0
15 "	k	4	0	35	5.2
29 "	l	5	0	43	7.8
2 Aug.	m	5	0	106	15.6
10 "	n	5&6	0	105	16.8
11 "	p	6	0	151	24.0
19 "	q	6	0	51	8.1
20 "	r	7	0	153	23.2
23 "	s	7&8	1	160	22.8
25 "	t	8	0	158	25.9
27 "	u	9	0	206	32.7
TOTALS			77	2085	299.9

LAUNCH #82					
16 Sept.	a	9&10	1	48	5.8
20 "	b	10	3	143	21.9
30 "	c	10&11	1	148	27.8
1 Oct.	d	11&12	1	157	23.7
8 "	e	12	3	198	32.2
11 "	f	13	1	149	25.1
13 "	g	13&14	1	169	22.3
14 "	h	14&15	17	182	24.0
25 "	j	15	2	133	18.2
26 "	k	15	3	90	12.1
27 "	l	15&16	1	81	11.0
TOTALS			34	1498	224.1

Area Surveyed - 20.3 sq. st. mi. ^{1955 Add. WK} ₁₉₆
3779

APPROVAL SHEET FOR
HYDROGRAPHIC SURVEY H-8165 (ECFP- 1254)

The records and boat sheet for Hydrographic Survey H-8165
(ECFP-1254) have been inspected by me and are approved. ✓

Additional field work is desirable as outlined in "Added
Notes by Chief of Party" which follow the text of the Descriptive
Report.

Clarence R. Reed

Clarence R. Reed
CDR, USCGS
OinC, East Coast Field Party

FLOATING AIDS TO NAVIGATION

H-8165 - ECFP-1254

1954 Light List	Lat.	Long.	Depth	Pos. No.	Date
✓ Cordage Channel Buoy #13	41° 59.17	70° 40.99	8 ✓	128h (red)	✓ 6-29-54
✓ " " #9	41° 59.32	70° 40.82	9 ✓	129h "	" "
✓ " " #5	41° 59.38	70° 40.73	9 ✓	130h "	" "
✓ " " #3	41° 59.40	70° 40.61	16 ✓	131h "	" "
✓ " " #1	41° 59.39	70° 40.51	13 ✓	132h "	" "
✓ Plymouth Harbor Channel					
Buoy #3	41° 58.89	70° 39.38	13	4a "	6-4-54
" #5	41° 58.77	70° 39.37	15	5a "	" "
" #7	41° 58.70	70° 39.31	13	6a "	" "
" #8	41° 58.45	70° 39.11	16	7a "	" "
" #10	41° 58.09	70° 38.80	25	8a "	" "
" #13	41° 57.95	70° 38.85	14	9a "	" "
" #12	41° 57.90	70° 38.91	16	10a "	" "
" #14	41° 57.76	70° 39.18	19	11a "	" "
" #15	41° 57.71	70° 39.19	18	12a "	" "
" #16	41° 57.61	70° 39.51	8	13a "	" "
" #17	41° 57.56	70° 39.55	17	14a "	" "
" #18	41° 57.60	70° 39.63	11	15a "	" "
" #19	41° 57.58	70° 39.70	11	16a "	" "
" #21	41° 57.63	70° 39.80	16	17a "	" "
" #23	41° 57.67	70° 39.91	11	18a "	" "
" #22	41° 57.72	70° 39.91	9	19a "	" "
✓ Nummet Junction Buoy	41° 59.35	70° 40.12	17	154h "	✓ 6-29-54
✓ " Channel Buoy #4	41° 59.22	70° 39.99	18	155h "	" "
✓ " " #2	41° 59.12	70° 39.52	19	46s "	8-23-54
✓ " " Entrance Buoy #	41° 59.20	70° 39.44	22	3a "	✓ 6-11-54
✓ Duxbury Bay Channel					
Buoy #1	41° 59.36	70° 39.20	22	171h (blue)	✓ 10-14-54
" " #2	41° 59.50	70° 39.05	23	107g (red)	✓ 6-25-54
✓ Gurnet Rock Buoy #2	42° 00.08	70° 35.62	27	1k (blue)	✓ 10-26-54
✓ " Point Bell Buoy	41° 59.96	70° 35.16	66	82t (red)	✓ 8-25-54
✓ Plymouth Harbor Channel					
Lighted Bell Buoy #1	41° 59.10	70° 39.25	21	1a (red)	6-11-54
✓ " " #2	41° 59.09	70° 39.37	20	2a "	✓ 6-11-54
✓ Plymouth Channel Lighted					
Buoy #3	41° 59.65	70° 36.52	27	128s "	✓ 8-23-54
" Channel Buoy #5	41° 59.17	70° 37.72	34	104n "	8-10-54
" " #6	41° 59.32	70° 37.93	23	105n "	" "
" " #4	41° 59.84	70° 35.89	22	1e (blue)	10-8-54
" Entrance Buoy #1	41° 59.52	70° 35.52	23	176e "	" "

ADDENDUM
To Accompany

HYDROGRAPHIC SURVEY H-8165 (Field No. ECFP-1254)

GENERAL

This appears to be an excellent basic survey and no unusual conditions were encountered during the smooth plot. *Review, P 7*

SOUNDINGS

Sounding are in generally good agreement at crossings with the exception of those between positions 60 and 81, 1 day (blue). Lat. 41-57.45 ; Long. 70-35.86. These soundings average from 1 to three feet deeper than surrounding hydrography. *Review, P's 2 & 7*

All soundings were reduced in the processing office with a template. ✓

Norfolk, Va.
17 Dec. 1956

Respectfully submitted,

Hugh L. Proffitt
Hugh L. Proffitt
Cartographer

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

REGISTER No. H-8165

Field No. ECFP-1254

State MASSACHUSETTS

General locality CAPE COD BAY

Locality PLYMOUTH BAY & HARBOR

Scale 1:10,000 Date of survey 13 to 20 July 1955

Instructions dated 29 Jan. 1954 & 17 Feb. 1955

Vessel EAST COAST FIELD PARTY

Chief of party MARVIN T. PAULSON

Surveyed by EDWIN K. McCAFFREY

Soundings taken by ~~fathometer~~ graphic recorder, hand lead, wire

Fathograms scaled by PARTY PERSONNEL

Fathograms checked by NORFOLK DISTRICT OFFICE

Protracted by A.G. ATWILL

Soundings penciled by A.G. ATWILL

Soundings in ~~fathoms~~ XXXX feet at MLW ~~XXXX~~

REMARKS: This report covers additional work accomplished during the 1955 field season.

See Title Sheet in front combining the work of 1954 & 55 seasons.

SUPPLEMENTARY DESCRIPTIVE REPORT
TO ACCOMPANY

Hydrographic Sheet H-8165

EAST COAST FIELD PARTY

MARVIN T. PAULSON, CHIEF OF PARTY

PROJECT 1368

1955

SCALE 1:10,000

* * * * *

PROJECT This survey was accomplished under instructions dated 29 January 1954, and supplemental instructions 22/MEK FP-East Coast dated 17 February 1955. ✓

SURVEY LIMITS AND DATES This sheet's survey limits are the same as were surveyed in 1954. In addition to the junctions noted in the 1954 survey; the offshore portion of this survey makes an excellent junction with contemporary survey H-8164 to the north. ✓

With the exception of 0.6 sq. statute miles in the northeast corner of this sheet, all work done was development of the 1954 survey. ✓

Work began 13 July and ended 20 July 1955.

VESSELS AND EQUIPMENT Launch number CS-172 was used in this survey. It operated from a mooring east of State Pier at Plymouth, Massachusetts. ✓
Echo soundings were obtained with graphic recorder No. 77, operated with transducer units mounted inboard in the launch bilges. ✓

TIDES AND CURRENTS The tide station was maintained at State Pier, Plymouth Harbor, Massachusetts. The tide note is appended to this report. No current observations were made on this project. ✓

SMOOTH SHEET The smooth sheet is to be plotted by the Norfolk Processing Office. ✓

CONTROL STATIONS The control consisted mainly of triangulation and photo-hydro stations. There were no additions to the control stations previously established for this survey. A list of the signals used is attached to this report. ✓

SHORELINE AND TOPOGRAPHY There were no additions or revisions to the shoreline and topographic details of the original (1954) survey. ✓

SOUNDINGS Soundings were taken by graphic recorder, sounding pole and hand lead. Bottom samples were obtained using an armed hand lead. ✓

CONTROL OF HYDROGRAPHY The sounding lines on this survey were controlled by three point sextant fixes to appropriate control stations. Fixes were taken at $1\frac{1}{2}$ minute intervals. No unusual position jumps were observed in changing fixes. ✓

Check angles were taken to verify the location of all detached positions.

ADEQUACY OF SURVEY This survey is considered adequate to supersede prior surveys. ✓

CROSSLINES Crosslines were run as instructed with satisfactory agreement at all crossings. ✓

COMPARISON WITH PRIOR SURVEYS The following discussion will be confined to a comparison with the 1954 survey on this sheet. In general few changes were noted, and good agreement was noted at most crossings.

Lines run in the vicinity of the 18 foot curve at $41^{\circ}-59.5'$; $70^{\circ}-36.0'$ indicate a slight erosion of the tip of the shoal at that point. Position 10-11 a; 2-3 a; and 18-19 a show depths approximately 2 feet deeper in depths formerly 18 feet. (*shoaler depths of 1954 retained on smooth sheet*)

COMPARISON WITH CHART The crooked channel through Ichabods Flat ($41^{\circ}-59.5'$; $70^{\circ}-41.6'$ approx.) does not appear to be as extensive as is charted. The western portion, adjacent to Rocky Point, is not continuous, shoaling having closed the channel in several places. It is recommended that the chart be so altered as to show this change. *Photos show channel to be open* ✓

Development of Gurnet Rock and the 5 foot spot southwest (Item 3 of Preliminary Review) revealed no depths shoaler than the 12 and 8 found in the 1954 survey. This development (position 1-25 b day) was run in gentle weather at less than half tide. Several shoal depths lie 100-200 meters west of the charted 4-5. It is suggested that the two are presently mischarted too far east. A 1.8 foot sounding was found between position 9-10 b lying 85m NW of the charted 5 foot spot. A depth of 7.0 feet lies immediately north 75m on the same sounding line. *Review, #5* ✓

A depth of 3.2 feet was recorded between positions 11-12 b lying 140m WNW of Gurnet Rock. ✓

The least depth on Tautog Rock was 2.0' recorded in the 1954 survey. No specific reinvestigation was made, although a search was made on the evening of 18 July 1955 while returning from the working grounds on H-8166. ✓

~~Investigations on c day, and d day (positions 1-12) show that the channels charted at $42^{\circ}-00.5'$; $70^{\circ}-41.1'$ and $41^{\circ}-58.7'$; $70^{\circ}-40.5'$ are now nonexistent.~~

COAST PILOT No additions to Coast Pilot are recommended since the date of the last report.

AIDS TO NAVIGATION No aids to navigation were located since the date of the last survey. ✓

LANDMARKS From 567 has been submitted with the correct position of Manomet Tower, to be charted as a landmark. *C.L. 97(1955)* ✓

GEOGRAPHIC NAMES No changes or revisions to geographic names are recommended.

MISCELLANEOUS Predicted tides were used in reducing all boat sheet soundings.

The weather stamps in the sounding volumes uses the Beaufort Wind Scale and symbols for sky conditions. ✓

Tide reducers are entered on the fathograms for the convenience of the processing office. Velocity corrections are attached to the original of this report.

Approved and forwarded,
Marvin T. Paulson
Marvin T. Paulson, Chief of Party

Respectfully submitted,
Edwin K. McCaffrey
Edwin K. McCaffrey, ENS.USC&GS

APPROVAL SHEET FOR
HYDROGRAPHIC SURVEY SH-8165 (ECFP 1254)

This report is a supplement to the report submitted with the 1954 survey records. The survey consisted of development of shoals and additional lines to meet spacing requirements and delineate channels as noted by the Washington Office review.

The sheet has been reviewed by me and is approved as complete and no additional surveys required. The survey was accomplished by a detached party so supervision and inspection of the sheet and records could not be made daily, but inspections were made periodically throughout the season to check records, progress, and make recommendations.

Your attention is invited to a modified method of entering sounding reducers. By verbal approval from the Chief, Coastal Surveys Division, and with special instructions from the Norfolk District Processing Office, Tide Reducers have been entered directly on the fathogram instead of the usual method of entering the reducers in the hydrographic Record Volumes.

Tides entered at N.P.O.

The Fathometer Corrections have been listed and are a part of this report. These corrections also have not been entered in the Record Volume.

A separate report will be written in detail regarding the purpose, method and results of this new method of entering fathometer sounding reducers.

The soundings were recorded in the usual manner and the fathograms scanned to check the record.

Marvin T. Paulson
Marvin T. Paulson
LCdr., C&GS, OinC.

TIDE NOTE
TO ACCOMPANY

Hydrographic Survey Sheet H-8165

Tide data for the reduction of soundings was obtained from a portable automatic tide gage at State Pier, Plymouth Harbor, Massachusetts. This gage was maintained by party personnel. The mean low water plane of reference was furnished by the Washington Office. ✓

<u>STATION</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>MLW ON STAFF</u>
State Pier, Plymouth, Mass.	41°-57.57'	70°-39.77'	0.1

VELOCITY CORRECTIONS

additional work

Graphic recorder No. 77 and launch CS-172 were used exclusively in this survey. This sheet was one of three comprising Project 1368. Bar checks were taken for all three sheets, and for convenience were tabulated in one abstract, enclosed in the original of report H-8164. The correct initial setting for this launch and recorder is 0.0 ft. Any deviation from this requires an index correction be applied to soundings. A summary of the velocity corrections follows:

CORRECTIONS IN FEET

A SCALE	B SCALE	C SCALE
0.0 to 5.0	+0.8 from 35.0 to 39.0	-0.6 from 70.0 to 74.5
+0.2 from 5.2 to 9.4	+0.6 from 39.2 to 42.0	-0.8 from 75.0 to 78.5
+0.4 from 9.6 to 18.0	+0.4 from 42.2 to 44.6	-1.0 from 79.0 to 82.5
+0.2 from 18.2 to 26.6	+0.2 from 44.8 to 47.0	-1.2 from 83.0 to 86.5
0.0 from 26.8 to 31.2	0.0 from 47.2 to 50.0	-1.4 from 87.0 to 90.5
-0.2 from 31.4 to 37.0	-0.2 from 50.2 to 54.0	-1.6 from 91.0 to 94.5
-0.4 from 37.2 to 55.0	-0.4 from 54.2 to 58.0	-1.8 from 95.0 to 98.5
	-0.6 from 58.2 to 62.0	-2.0 from 99.0 to 102.5
	-0.8 from 62.5 to 66.0	-2.2 from 103.0 to limit
	-1.0 from 66.5 to 70.0	of sdg.
	-1.2 from 70.5 to 74.0	
	-1.4 from 74.5 to 78.0	
	-1.6 from 78.5 to 82.0	
	-1.8 from 82.5 to 86.0	
	-2.0 from 86.5 to 90.0	

STATISTICS

HYDROGRAPHIC SURVEY SHEET H-8165

DATE 1955	DAY LTR.	VOL. NO.	NO. POS.	STAT. MI. SDG. LINE
13 July	a	1	38	4.9
14 July	b	1	94	12.8
19 July	c	1	6	1.1
20 July	d	1	58	6.6
			<hr/> 196	<hr/> 25.4

Area surveyed 0.6 sq. stat. mi.

GEOGRAPHIC NAMES

Survey No. H-8165

Name on Survey	<div>On Chart No.</div> <div>On previous survey No.</div> <div>On U. S. quadrangle Maps</div> <div>From local information</div> <div>On local Maps</div> <div>P. O. Guide or Map</div> <div>Rand McNally Atlas</div> <div>U. S. Light List</div>										
	A	B	C	D	E	F	G	H	K		
<u>Massachusetts</u>	)									1
<u>Cape Cod Bay</u>	)	for title								2
<u>Outer Tautog Rock</u> ✓										3	
<u>Rocky Point</u> ✓										4	
<u>Warren Cove</u> ✓										5	
<u>Plymouth Bay</u> ✓										6	
<u>Brown's Bank</u> ✓									BGN	7	
<u>Plymouth Harbor</u> ✓										8	
<u>Plymouth</u> ✓										9	
<u>Goose Point Channel</u>										10	
<u>Ichabods Flat</u> ✓										11	
<u>The Nymmet</u>										12	
<u>Kingston Bay</u> ✓										13	
<u>Kingston</u> ✓										14	
<u>Jones River</u> ✓										15	
<u>Duxbury Bay</u>										16	
<u>Saquish Head</u> ✓										17	
<u>Gurnet Point</u> ✓									BGN	18	
<u>Gurnet Rock</u>									"	19	
<u>WHITE FLAT</u>			Names approved 1-24-57 L. Heck. h. H.								20
										21	
<u>State Pier</u>		(tide station)								22	
										23	
See chart 245 for placement of some of above names, after sheet is inked.										24	
										25	
										26	
										27	

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. 8165.....

Records accompanying survey:

Boat sheets ..1...; sounding vols.. .17...; wire drag vols.;
bomb vols.; graphic recorder rolls .15-Envelopes
special reports, etc. .1-Smooth sheet and 1-Descriptive report.
.....

The following statistics will be submitted with the cartographer's report on the sheet;

Number of positions on sheet	.....	3779
Number of positions checked	.....	198
Number of positions revised	.....	35
Number of soundings revised (refers to depth only)		
<i>soundings corrected arbitrarily for errors considered to be due to faulty speed of entry</i>		54 *
Number of soundings erroneously spaced	.....	450 0
Number of signals erroneously plotted or transferred	.....	0
Topographic details	Time	40
Junctions	Time	16
Verification of soundings from graphic record	Time	8

Verification by *J.E. Grackert* Total time *420* Date *8-9-57*
Reviewed by *J.A. Piusmore* Time *68* Date *1-20-58*

* does not include minor revisions up to 1.4'
~~or soundings to which arbitrary correction have been applied~~

PHC

TIDE NOTE FOR HYDROGRAPHIC SHEET

Chart Division: R. H. Carstens:

5 February 1957

Plane of reference approved in
17 volumes of sounding records for

HYDROGRAPHIC SHEET 8165

Locality Plymouth Harbor, Massachusetts

Chief of Party: C. R. Reed in 1954
M. T. Paulson in 1955

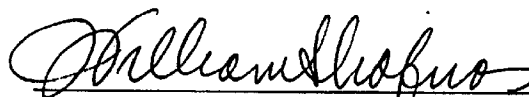
Plane of reference is mean low water, reading

0.1 ft. on tide staff at Plymouth

15.8 ft. below B.M. 10 (1954)

Height of mean high water above plane of reference is
9.5 feet.

Condition of records satisfactory except as noted below:



Signature

Chief, Tides Branch

DIVISION OF CHARTS
REVIEW SECTION - NAUTICAL CHART BRANCH

REVIEW OF HYDROGRAPHIC SURVEY

REGISTRY NO. H-8165

FIELD NO. ECFP-1254

Mass., Cape Cod Bay, Plymouth Bay and Harbor

Surveyed: June-Oct. 1954 & July 1955 Scale 1:10,000

Project No. CS-368

Soundings:

808 Depth Recorder
Hand Lead
Pole

Control:

Sextant fixes on shore
signals

Chief of Party - C. R. Reed & M. T. Paulson
Surveyed by - E. K. McCaffery
Protracted by - A. G. Atwill
Soundings plotted by - A. G. Atwill
Verified and inked by - J. E. Gearhart
Reviewed by - T. A. Dinsmore
Inspected by - R. H. Carstens

Date: 20 Jan. 1958

1. Shoreline and Signals

The shoreline originates with the unreviewed manuscripts of T-11173, T-11174, T-11177 and T-11178 of 1953.

The origin of the signals is given in the Descriptive Report.

2. Sounding Line Crossings

Depths at crossings are in good agreement after applying the corrections noted in paragraph 7.

3. Depth Curves and Bottom Configuration

The usual depth curves are adequately delineated. The 3-ft. curve has been added to more clearly define the bottom configuration in the shoal areas.

The most conspicuous feature in the area is the expansive shoal (Browns Bank) which flanks the entrance channel on the south for a distance of about $2\frac{1}{2}$ miles. The offlying crest of the shoal occurs in lat. $41^{\circ}59.6'$, long. $70^{\circ}36.3'$, where the shoal rises abruptly to within 1 ft. of the surface from adjacent channel depths of 29 ft. Except for the undulations on this shoal and minor irregularities in the entrance channel, the bottom of Plymouth Bay is generally smooth.

On the inland side, the expansive tidal flats of Plymouth Harbor and Duxbury Bay are broken up by a pattern of natural channels.

4. Junctions with Contemporary Surveys

Adequate junctions were effected with H-8164 (1954-55) on the north, H-6563 (1940) on the east and H-8166 (1954-55) on the southeast.

5. Comparison with Prior Surveys

a. H-422 (1853) 1:10,000	H-3034 (1909) 1:10,000
H-516 (1854-05) 1:80,000	H-3413 (1912) 1:20,000
H-1035 (1863-70) 1:10,000	H-3905 (1916) 1:10,000
H-1067 (1870) 1:10,000	<u>H-3906 (1916) 1:10,000</u>
<u>H-1339 (1875) 1:10,000</u>	

The present survey falls within the area covered by these prior surveys. A comparison of the prior and present surveys reveals that bottom changes have taken place in this area. Lesser depths were generally obtained on the present survey than those previously found. The 18-ft. depth curve delineating the outer extremity of Browns Bank has moved seaward as much as $\frac{1}{3}$ of a mile. Conspicuous examples of bottom changes in the vicinity of Browns Bank are indicated in the following comparison:

<u>Latitude</u>	<u>Longitude</u>	<u>Prior Depth</u>	<u>Present Depth</u>
$41^{\circ}59.5'$	$70^{\circ}35.7'$	30	16
59.6	36.3	10-12	1-3
59.35	36.45	16-20	3
59.27	36.75	1	13
59.1	37.25	10	0

Except in the area of the above examples, present depths in Plymouth Bay are generally 1 to 6 ft. less than the prior depths.

Within Kingston Bay and Plymouth Harbor, depths in the principal channels generally range from 1-6 ft. less than the prior depths.

Many of the prior tidal drains have become obliterated from deposition of sediment or spoil. A general shoaling of the bay area is clearly indicated.

The 4- and 5- ft. soundings charted in lat. $42^{\circ}00.14'$, long. $70^{\circ}35.74'$, and lat. $42^{\circ}00.08'$, long. $70^{\circ}35.87'$, respectively from H-422 should be disregarded. Falling in depths of 15 ft. on the present survey, the prior soundings are considered to be out of position because of weak control on the prior survey and should actually fall from 70 to 150 meters inshore where comparable depths were obtained on the present survey.

The piling charted in lat. $42^{\circ}00.5'$, long. $70^{\circ}41.05'$, originates with H-3906 at which time (1916) they were described as old piling. Inasmuch as the present survey and contemporary air photographs do not show the piling, they are presumed to be now nonexistent.

The rock awash in lat. $41^{\circ}59.7'$, long. $70^{\circ}37.65'$, on H-3906 falls in present and prior depths of 12-18 ft. This rock which was recorded as uncovering 1 ft. at MLW was specifically searched for at 1 ft. of tide on the present survey and was not seen. The rock awash on H-3906 is considered to be out of position and should be disregarded. The rock awash symbol was removed from the chart during the application of the present survey.

Where little or no bottom changes are indicated several critical soundings have been carried forward from the prior surveys. Numerous inshore rocks have also been retained from the prior surveys. With these additions, the present survey is adequate to supersede the prior surveys within the common area.

b. H-3776 (1915-16) W. D.

This wire-drag survey covers the offshore portion of the present survey. No conflicts exist between the effective drag depths and depths on the present survey. Several critical soundings have been retained from this wire-drag survey.

6. Comparison with Chart 245 (Latest print date 10/7/57)

A. Hydrography

Charted hydrography originates principally with the prior surveys which need no further consideration. The present survey has been partially applied to the chart

prior to verification and review. Numerous revisions have been made to smooth-sheet soundings during verification.

The following charted information is noted:

(1) The 18-ft. channel-sounding charted in lat. $41^{\circ}59.6'$, long. $70^{\circ}39.08'$, from the boat sheet of the present survey should be disregarded. The sounding is in error and was subsequently corrected to 28 ft. during the check scanning of the fathograms. The corrected depth agrees with surrounding depths.

(2) The 13-ft. sounding charted in lat. $41^{\circ}57.4'$, long. $70^{\circ}34.95'$, from the boat sheet of the present survey should be disregarded. An illegible 18 was apparently mistaken for 13.

(3) The sunken wreck of the fishing vessel "Mayflower" charted in lat. $42^{\circ}00.35'$, long. $70^{\circ}35.35'$, originates with information (H. O. Notice to Mariners 39, 1956) subsequent to the present survey. The wreck symbol should be retained on the chart. *

The charted information is superseded by the present survey except as noted in the preceding paragraph.

B. Dredged Channels

Charted depths in the Plymouth Harbor channel originate with the present survey prior to verification and review. Although no important discrepancies are noted, mention is made that some of the soundings charted have been replotted or shifted in position during verification of the smooth sheet.

C. Aids to Navigation

Many of the aids to navigation located on the present survey differ appreciably in position with the charted aids. The charted aids appear to adequately mark the features intended.

The positions of several channel buoys within Plymouth Harbor were charted from information (H. O. Notice to Mariners Nos. 8 & 12, 1956) subsequent to the present survey.

Plymouth Harbor South Channel Range Lights (front and rear) charted from information shown in chart letter 1067 (1953) are in disagreement with positions shown on the present survey.

In apparent agreement 2nd

7. Condition of Survey

- a. The sounding records are complete; the Descriptive Report covers most matters of importance.
- b. The smooth plotting was generally accurate. However, several positions from "d" and "e" days (red) were re-plotted using a photo-identified object (high school gable) instead of signal Pig as control. The revised plotting corrected glaring discrepancies in the Plymouth Harbor channel depths. The most conspicuous example was the removal (by replotting) of minus 1-ft. soundings from the middle of the entrance channel.
- c. Arbitrary corrections of from 1 to 3 ft. were applied to about 450 soundings on portions of several sounding lines. These correctors effected agreement with cross-line soundings and adjacent hydrography. The discrepancies were probably caused by erratic fathometer speed which was not detected during field operations because of recording time from the graphic record rather than from the clock.
- d. Low-water air photographs were utilized during verification to aid in developing the tidal drains and the continuity of the channels in Plymouth Harbor and Kingston Bay. In this area, the present survey did not provide adequate development for the continuity of all channels. A sounding line along the axis of several of the undeveloped channels would have been helpful. Use of air photographs during the plotting of the smooth sheet would have resulted in a truer portrayal of actual conditions.

8. Compliance with Project Instructions

The survey adequately complies with the Project Instructions except as noted in the preceding paragraphs.


9. Additional Field Work

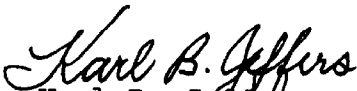
With the retention of several prior rocks and soundings, the survey is considered basic and no additional field work is recommended. Several shoal indications appearing in the off-shore area would require further investigation had not a

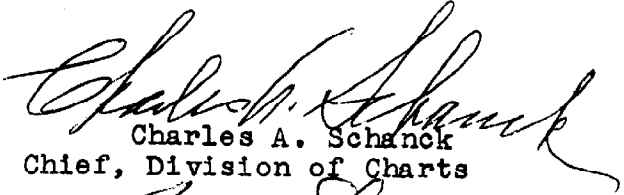
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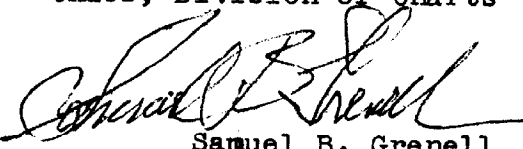
wire-drag survey been previously done. The Corps of Engineers makes periodic surveys of the dredged channel leading to Plymouth.

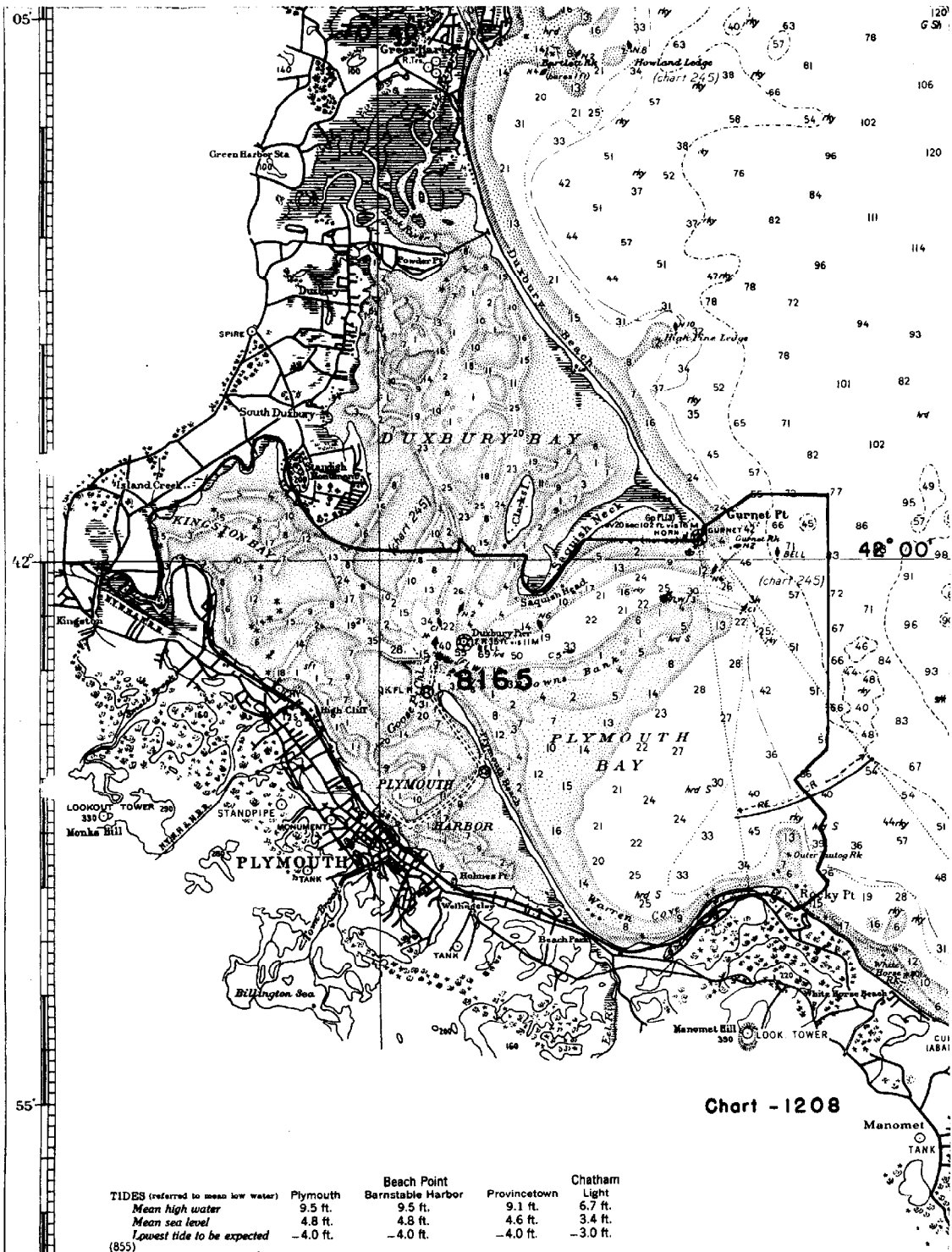
Examined and approved:


Max G. Ricketts
Chief, Nautical Chart Branch


Karl B. Jeffers 2/20/58
Chief, Hydrography Branch


Charles A. Schanck
Chief, Division of Charts


Samuel B. Grenell
Chief, Division of Coastal Surveys



NAUTICAL CHARTS BRANCH

SURVEY NO. H-8165

Record of Application to Charts

DATE	CHART	CARTOGRAPHER	REMARKS
4/16/57	1208	H.K. Benson	Before ^{before} After Verification and Review Partially applied
8-21-57	245	R.H. Delander	Before ^{before} After Verification and Review Part. appld. Critical info only.
9-10-57	1208	R.H. Delander	Before ^{Part appld.} After Verification and Review during Year 9 Before Review done and Proj # 37.
8-15-58	245	T.A. Dinamore	Before After Verification and Review a few critical revisions made as noted in the Review (Cht. is scheduled for reconstruction)
11/19/59	245	H.W. Burgoyne	Before After Verification and Review - Crit Corrs. only
12/29/59	245	H.W. Burgoyne	Before After Verification and Review - Completely applied
1/12/61	1208	O.S.	Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review
			Before After Verification and Review

M-2168-1

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.